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and the religious respect of such bodies formed two leading features in ancient science and mythology. In some of the earlier chapters he very properly gives the elements of astronomical knowledge requisite to calculating the position of the stars at fixed periods, and also the methods for determining with accuracy the "orientation" of buildings. This is by no means the same everywhere, and he justly observes that where we find such a contrast as in the temples of Thebes and Memphis, in one of which we find "solstitial" and in the other "equinoctial" orientation, it demands almost a difference of race to explain it.

Professor Lockyer, availing himself of the French and German surveys of the temples of Egypt, aided by studies of his own made on the spot, finds that one of the main objects of the temple of Karnak, for instance, was for the purpose of obtaining an exact observation of the precise time of the solstice; that many of the temples were not intended for solar but for stellar observations; and as these, owing to the change of place of the stars, would not have remained true for more than three hundred years, they furnish us a means of approximating the date of their construction. On this theory, the author calculates one of the temples at Edfu to have been constructed for the observation of the star Canopus, and to have been built about 6400 B. C. This extends the epoch of culture in Egypt far beyond the time usually fixed by modern archaeologists, and illustrates the great value of the author's methods, if they should prove acceptable to the scientific world.

Several chapters of the volume are occupied with the astronomy of the early Babylonians. It would seem this was based on independent observations not less ancient than those of Egypt, but at first exerting no influence upon them. Later, at an undetermined but a very remote period, the astronomic science of northern (lower) Egypt was deeply tinged with the stellar and solar doctrines and myths of Mesopotamia.

The volume is full of suggestions for future research, and there is no question but that it puts in the hands of investigators new methods of throwing unexpected light on the origins of civilization. We earnestly hope that not in the Old World only, but in the great ruins of Mexico, Central America and Peru, they will be applied.

Inorganic Chemistry for Beginners. By SIR HENRY ROSCOE, F.R.S., D.C.L., LL.D., M.P. Assisted by JOSEPH LUNT, B.Sc. (Vict.), F.C.S. New York and London, Macmillan and Co., 1893, 245 p.

WE are always glad to welcome a text-book such as the above, and to mark its improvement over the vast number of elementary text-books in chemistry which have become so common of late. The book is arranged with a proper understanding of a beginner's necessities, and instead of a few paragraphs on chemical theory followed by a dictionary-like description of the chemical elements, we have a proper discussion of the principles, the study of the elements being introduced by a careful analysis of these principles as applied to a few, well chosen, typical examples. It is ridiculous to expect a beginner in any science to grapple at once with its particular symbols and to memorize details which are of no moment. We say of no moment, for without proper introduction these details are meaningless. The laboratory manual has too often been mistaken for a text-book of the science.

We note particularly in the above work the chapters on elements and compounds, combination in definite and multiple proportions, calculations, physical measurements, and the properties of gases. In Part II. the following non-metallic elements are studied with their more important compounds: Oxygen, hydrogen, nitrogen, chlorine, sulphur and carbon.

Principles and Practice of Agricultural Analysis. A manual for the Examination of Soils, Fertilizers and Agricultural Products. By HARVEY W. WILEY, Chemist of the United States Department of Agriculture. Easton, Pa., The Chemical Publishing Company. Vol. I., No. 1, 1894.

THE first number of this work has been received, and while it may yet be too early to judge of the character of the book as a whole, our expectations are raised, and we shall look for an epoch-making work on agricultural chemistry. Professor Wiley is of all men in this country the most competent to write upon the subject, his long connection as Chief of the Chemical Department of the United States Department of Agriculture and his many writings in scientific journals being sufficient evidence of this. Part first includes an introduction, in which the elements of the earth's "crust" are discussed, particularly in their relation to agriculture, together with the rock-forming minerals and finally the subject of rocks and rock decay. The typographic work is excellent, and the number is well illustrated with sketches and with reproductions of photographs illustrating microscopic rock structure and the physical changes in rocks. It is proposed to issue this work in twenty to twenty-four monthly parts of forty-eight pages each, selling at twenty-five cents a number.

NOTES AND NEWS.

MACMILLAN & Co.'s announcements of forthcoming books include "The Study of the Biology of Ferns by the Collodion Method," for advanced and collegiate students, by George F. Atkinson, associate professor of cryptogamic botany in Cornell University; "Mental Development in the Child and the Race," by James Mark Baldwin, Stuart professor of experimental psychology in the College of New Jersey, author of "Handbook of Psychology," etc.; "Materials for the Study of Variation in Animals," part i., "Discontinuous Variation," by William Bateson, M.A., Balfour student and fellow of St. John's College, Cambridge, illustrated; "A Three Months' Course of Practical Instruction in Botany," by F. O. Bower, D.Sc., regius professor of botany in the University of Glasgow; abridged edition of "A Course of Practical Instruction in Botany," by the same author; "A History of Mathematics," by Florian Cajori, professor in Colorado College; "A Course in Experimental Psychology," by James McKeen Cattell, A.M., Ph.D., professor of experimental psychology in Columbia College; "The Gypsy Road, a Journey from Krakow to Coblenz," by Professor G. A. J. Cole, M.R.I.A., F.G.S., illustrated; "Elements of Metaphysics," by Professor Karl Deussen, of Kiel, authorized translation; "Life in Ancient Egypt," described by Adolf Erman, translated by H. M. Tirard, with numerous illustrations and maps; "Physiology for Beginners," by Michael Foster, M.A., M.D., LL.D., F.R.S., and L. E. Shore, M.A., M.D., B.C.; "Western Europe in the Fifth Century," lectures delivered at Oxford, by E. A. Freeman, D.C.L., late regius professor of modern history in the University of Oxford; "Western Europe in the Eighth Century," lectures delivered at Oxford by E. A. Freeman, D.C.L.; "The Life of Sir A. C. Ramsay," by Sir Archibald Geikie, F.R.S.; "A Short Manual of Philology for Classical Students," by P. Giles, M.A., fellow of Gonville and Caius College, reader in philology in the University, Cambridge, uniform with Dr. Gow's "Companion to School Classics"; "Town Life in the Fifteenth Century," by Alice Stopford Green, in two volumes, 8vo; "Hydrostatics," by A. G. Greenhill, F.R.S., professor of mathematics to the senior class of artillery officers,

Woolwich; "Logic," by Williston S. Hough, A.M., assistant professor of mental and moral philosophy in the University of Minnesota; "Methods of Histological Research," for the use of students and physicians, by Dr. C. von Kahliden, lecturer in the University of Freiburg, translated by H. Morley Fletcher, M.A., M.B.; "Popular Lectures and Addresses," Vol. II., contributions to geology, by Lord Kelvin, P.R.S. (Sir William Thomson); "Sketches in Sport and Natural History," by the late George Kingsley, M.D.; "Text-book of Embryology: Invertebrates," by Drs. Korschelt and Heider, privatdozenten, University of Berlin, translated and edited by Edward Laurens Mark, Ph.D., Hersey professor of anatomy, Harvard University, and William McMichael Woodworth, Ph.D., instructor of microscopical anatomy, Harvard University, fully illustrated; "Organic Chemistry," translated by Alexander Smith, professor of chemistry in Wabash College; "Macmillan's School Library," "Town Geology," by Charles Kingsley; "Physiography for Beginners," by J. E. Marr, F.R.S., F.G.S., and Alfred Harker, M.A., F.G.S.; "Pain, Pleasure and Aesthetics," an essay concerning the psychology of pain and pleasure, with special reference to aesthetics, by Henry Rutgers Marshall, M.A.; "A Manual of Laboratory Physics," by Edward L. Nichols, Ph.D., professor of physics, Cornell University; "A Manual of Physical and Chemical Measurements," by Professor Wilhelm Ostwald, translated by Dr. James Walker; "The Theory of Heat," by Thomas Preston, M.A., Trinity College, Dublin, with illustrations; "The Theory of Sound," by Lord Rayleigh, F.R.S., formerly fellow of Trinity College, Cambridge, new edition, in 2 vols., 8vo (in this new edition the whole subject will be included in two volumes); "Modern Plane Geometry," by the Rev. G. Richardson, assistant master at Winchester College, and A. S. Ramsey, Fettes College, Edinburgh; "The Rise and Development of Organic Chemistry," by the late C. Schorlemmer, F.R.S., trans-

lated and edited by Professor Smithells, Yorkshire College, Leeds; "Atlas of Classical Antiquities," by Th. Schreiber, edited for English use by Professor W. C. F. Anderson, Firth College, Sheffield; "Systematic Survey of the Organic Matters," by Drs. G. Schultz and P. Julius, translated and edited, with extensive additions, by Arthur G. Green, F.I.C., F.C.S., examiner in coal-tar products to the City and Guilds of London Institute; "Elementary Algebra," by Charles Smith, American edition; "Geometrical Conic Sections," by Charles Smith, M.A., master of Sidney Sussex College, Cambridge; "Oxford and her Colleges," a view from the Radcliffe, by Goldwin Smith, D.C.L., author of "A Trip to England," "The United States: an Outline of Political History—1492-1871," etc., with frontispiece; "Practical Plane Geometry," by J. Humphrey Spanton, gold medallist of the Royal Academy of Arts, London, drawing instructor to the Royal Navy cadets of H.M.S. Britannia; "Elementary Mensuration," with exercises on the mensuration of plane and solid figures, by F. H. Stephens, M.A.; "Essays in Historical Chemistry," by Professor T. E. Thorpe, F.R.S.; "Organic Chemistry for beginners," by G. S. Turpin, M.A. D.Sc.; "Lectures of Human and Animal Psychology," by Wilhelm Wundt, Ph.D., M.D., Dr. Jur., professor of philosophy in the University of Leipzig, author of "Grundzüge der Physiologischen Psychologie," "Ethik," "Logik," "System der Philosophie," etc., editor of the *Philosophische Studien*, translated from the second and revised German edition (1892) by J. E. Creighton, A.B. (Dalhousie), Ph.D. (Cornell), associate professor of modern philosophy in Cornell University; and E. B. Titchener, A.B. (Oxon.), Ph.D. (Leipzig), assistant professor of psychology in Cornell University.

—The French world of science has suffered a severe loss in the recent death of Professor Edmond Fremy, of Paris. Born in 1814, his father a professor at St. Cyr, Fremy began the study of chemistry during a period of great

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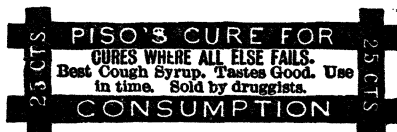
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activity in that science and by his labors extending to the present day has done much to further its advance. His first publications date from 1835 and include many valuable memoirs, but in this country he is probably best known through his treatise on chemistry in six volumes, and through his magnificent chemical encyclopedia. Probably his most recent work is that published but a short time ago in conjunction with a pupil, M. Verneuil, a treatise on the artificial production of rubies.

—An "Elementary Textbook of Agricultural Botany of the University Extension Series," by M. C. Potter, Professor of Botany in the Durham College of Science, Newcastle-upon-Tyne, has just been published by Methuen and Co., of London. The writer considers it the best botany extant for beginners. Scientific facts are presented in such a clear, forcible and interesting way that the rudiments of botany may be acquired by its use with little effort and without the aid of a teacher. It begins at once with the study of the cell instead of the seed, as is customary in such books. He treats of the seed under the fruit where it belongs and of which it is the essential part. The study of the microscopical parts of plants is too often neglected because of a lack of knowledge of the use of the microscope and technique, without which, however, it is superficial and disjointed. There is a chapter on plant food, another on reproduction, another on grasses, another on the bean family with its bacteroids and another very valuable chapter on the commonest plant diseases. It ends with a brief system of classification. The book is invaluable to young agriculturists, for whom it was especially intended. The writer has introduced it into his beginning classes and finds it excellent.

—The Open Court Publishing Company have issued Professor Ribot's work on "The Diseases of Personality" in their Religion of Science Library. By diseases of personality M. Ribot means such nervous diseases as affect the mind, including not only the various forms of insanity

but also the milder kinds of mental disorder, whether affecting the intellect or the emotions; but as the work before us was noticed in *Science* when it appeared in a bound volume some years ago, we need not dwell on the author's views now. The books forming the Religion of Science Library, of which this is the fourth, are published in pamphlet form, with good clear type, at twenty-five cents a number, or \$1.50 a year, and will include works both new and old on various subjects in science and philosophy.

—The University Press at Cambridge has undertaken to publish a complete translation of the Pali Jataka or "Buddha Birth-stories," which are supposed to be the oldest collection of folk-lore stories in existence. The first volume is now in the press, and has been prepared by Mr. R. Chalmers, late of Oriol College, Oxford, a former pupil of Prof. Rhys Davids. It will contain the forty stories given in Prof. Rhys Davids's discontinued translation, but will also give the remainder of the first volume of Prof. Fausbøll's edition of the Pali text. The second volume is translated by Mr. W. H. D. Rouse, Fellow of Christ's College, and the third by Mr. R. A. Neil, Fellow and assistant-tutor of Pembroke College, and Mr. H. T. Francis, under-librarian of the University Library at Cambridge and late Fellow of Gonville and Caius College. The whole translation will appear under the editorship of Prof. Cowell, of Cambridge. The work is expected to fill seven or eight volumes; but at present only five volumes of the Pali text have appeared. Each volume of the text is to be represented by a volume of the translation. This Buddhist collection of stories will be of great interest and importance for students of folk-lore; and it will also be of value as illustrating the manners and customs of ancient India. The stories are generally told in a simple popular style, with not infrequent touches of quaint humor and pathos; and they give us a moving panorama of Hindu society in the immediate centuries before our era.

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